PA IT COOPERATION TREAT

From the INTERNATIONAL BUREAU

PCT

NOTIFICATION OF ELECTION

(PCT Rule 61.2)

To:

Commissioner
US Department of Commerce
United States Patent and Trademark
Office, PCT
2011 South Clark Place Room
CP2/5C24
Arlington, VA 22202
ETATS-UNIS D'AMERIQUE

in its capacity as elected Office

Date of mailing:	
25 January 2001 (25.01.01)	
International application No.: PCT/GB00/01481	Applicant's or agent's file reference: A.CASATI 2-3-
International filing date: 18 April 2000 (18.04.00)	Priority date: 21 July 1999 (21.07.99)
Applicant: CASATI, Alessio et al	

1. The designated Office is hereby notified of its election made:

[X] in the demand filed with the International preliminary Examining Authority on:

11 November 2000 (11.11.00)

[ ] in a notice effecting later election filed with the International Bureau on:

2. The election [X] was

[ ] was not

made before the expiration of 19 months from the priority date or, where Rule 32 applies, within the time limit under Rule 32.2(b).

The International Bureau of WIPO
34, chemin des Colombettes
1211 Geneva 20, Switzerland

Facsimile No.: (41-22) 740.14.35

Authorized officer:

J. Zahra

Telephone No.: (41-22) 338.83.38

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PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference	FOR FURTHER ACTION	See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)
A.CASATI 2-3-3-3		
International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/GB00/01481	18/04/2000	21/07/1999
International Patent Classification (IPC) or national classification and IPC H04M7/00		
Applicant LUCENT TECHNOLOGIES INC		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 8 sheets, including this cover sheet.

   ☒ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

   These annexes consist of a total of 7 sheets.

3. This report contains indications relating to the following items:

   - I ☒ Basis of the report
   - II ☐ Priority
   - III ☒ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
   - IV ☐ Lack of unity of invention
   - V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations suporting such statement
   - VI ☐ Certain documents cited
   - VII ☒ Certain defects in the international application
   - VIII ☒ Certain observations on the international application

Date of submission of the demand	Date of completion of this report
11/11/2000	01.10.2001
Name and mailing address of the international preliminary examining authority: European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized officer Aullo Navarro, A Telephone No. +49 89 2399 2267

Form PCT/IPEA/409 (cover sheet) (January 1994)

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No. PCT/GB00/01481

I. Basis of the report

1. With regard to the **elements** of the international application *(Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17))*:
Description, pages:

4,7-9	as originally filed			
1-3,5,6	as received on	17/09/2001	with letter of	13/09/2001

Claims, No.:

1-14	as received on	17/09/2001	with letter of	13/09/2001

Drawings, sheets:

1/2,2/2	as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

   These elements were available or furnished to this Authority in the following language: , which is:

   - ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
   - ☐ the language of publication of the international application (under Rule 48.3(b)).
   - ☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

   - ☐ contained in the international application in written form.
   - ☐ filed together with the international application in computer readable form.
   - ☐ furnished subsequently to this Authority in written form.
   - ☐ furnished subsequently to this Authority in computer readable form.
   - ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
   - ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
- ☐ the claims, Nos.:
- ☐ the drawings, sheets:

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)):

   (Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

6. Additional observations, if necessary:

III. Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

1. The questions whether the claimed invention appears to be novel, to involve an inventive step (to be non-obvious), or to be industrially applicable have not been examined in respect of:

   ☐ the entire international application.

   ☒ claims Nos. 13,14.

because:

   ☐ the said international application, or the said claims Nos. relate to the following subject matter which does not require an international preliminary examination (*specify*):

   ☒ the description, claims or drawings (*indicate particular elements below*) or said claims Nos. 13,14 are so unclear that no meaningful opinion could be formed (*specify*):
   see separate sheet

   ☐ the claims, or said claims Nos. are so inadequately supported by the description that no meaningful opinion could be formed.

   ☐ no international search report has been established for the said claims Nos. .

2. A meaningful international preliminary examination cannot be carried out due to the failure of the nucleotide and/or amino acid sequence listing to comply with the standard provided for in Annex C of the Administrative Instructions:

   ☐ the written form has not been furnished or does not comply with the standard.

   ☐ the computer readable form has not been furnished or does not comply with the standard.

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes:	Claims	1-12
	No:	Claims	
Inventive step (IS)	Yes:	Claims	1-12
	No:	Claims	
Industrial applicability (IA)	Yes:	Claims	1-12
	No:	Claims	

2. Citations and explanations
see separate sheet

VII. Certain defects in the international application

The following defects in the form or contents of the international application have been noted:
see separate sheet

VIII. Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:
see separate sheet

III. Non-establishment of opinion:

1. Claims 13 and 14 are formulated in way contrary to the requirements of Rule 6.2(a) PCT, and should have hence been deleted.

V. Statement under Rule 66.2(a)(ii) PCT:

Reference is made to the following documents:

D1: HAEMAELAEINEN J ET AL: 'PROPOSED OPERATION OF GSM PACKET RADIO NETWORKS' IEEE INTERNATIONAL SYMPOSIUM ON PERSONAL, INDOOR AND MOBILE RADIO COMMUNICATIONS, vol. 1, pages 372-377, 27.09.95 XP002020137

D2: WO 99 16266 A (ERICSSON TELEFON AB L M) 1 April 1999 (1999-04-01)

1. The present application relates to a system (Claim 1) and a method (Claim 8) of enabling a mobile station of a Universal Mobile Telecommunications System UMTS to receive Voice over Internet-Protocol VoIP calls.

According to the standards defining UMTS, a mobile station MS can operate both as an Internet Protocol IP terminal and as a traditional mobile phone terminal. To enable the MS to receive VoIP calls, there are two **known** possibilities:
i) to use static IP address allocation; or
ii) to use dynamic IP address assignment, this requiring an active Packet Data Protocol PDP context to be always maintained.

The first solution has the **drawback** that, since an IP address is required for each mobile station regardless of its state, the very limited IP address space may be wasted (e.g., if an IP address is assigned to an inactive MS). A further problem follows from the association between the assignment of IP addresses to the MS

and its home network address space, which results in the routing of IP packets via its home network regardless of the current location of a MS, thus affecting the performance and service quality, especially when the MS is roaming away from its home network.

For the second solution, an active PDP context needs to be maintained even when a MS is not in communication, this representing another waste of IP address space and other network resources such as the resource for PDP management.

Therefore, according to the prior art, it is not possible for a MS to receive VoIP calls when dynamic addressing is used and when the MS is not in an active PDP context, because the network cannot initiate a PDP context set up and thus, the MS cannot receive calls, especially whilst roaming away from its home network.

2. The **invention** thus lies in that the above-mentioned drawbacks are overcome, according to the features of independent Claims 1 and 8, with the provision of a mechanism based on the Mobile Subscriber Integrated Services Digital Network number MSISDN associated with the mobile station MS or its user, such that a serving Gateway GPRS Serving Node GGSN of the roaming network is informed of the IMSI number of the called mobile station, and a serving VoIP call control server is arranged to map a called MSISDN number to the International Mobile Subscriber Identity IMSI number (corresponding to the mobile station associated with that MSISDN).

Following from the above (see Claim 2), the determination of the IMSI number results in a request from the serving VoIP server enabling the serving GGSN of the roaming network to initiate PDP a context set up procedure using the IMSI. As the mapping mechanism, there are two embodiments contemplated, the first (Claims 4 and Claims 9-10) being the storage of a mapping table (e.g. in a directory server accessible by the home VoIP server of the MS, that server then passing the result of the mapping operation to the serving VoIP server in the roaming network), while the second (Claims 5-6 and Claim 11) relates to an enhanced registration message such that the MS directly informs the serving VoIP server of its IMSI number.

3. The solution according to Claims 1 and 8 is deemed to involve an inventive step, as neither the cited documents, nor the prior art techniques acknowledged in the description, provide a solution to the problem of enabling a UMTS mobile station to receive VoIP calls established when dynamic IP addressing is used and the mobile station is not in an active PDP context while roaming away from a home network.

   In particular, **D1** and **D2** relate to the general case of providing packet communications in a mobile telecommunications network such as GSM that the skilled person could particularise to the case of voice transmitted in packet form, generally known in the art (e.g. voice over IP). However, the problem faced by the present application is not addressed (and thus not solved) by these documents.

4. Therefore, the subject-matter of independent Claims 1 to 8, as well as that of their respective dependent Claims 2 to 7 and 9 to 12 (relating to further details of the corresponding system and method, respectively), meets the requirements of Article 33(1)-(4) PCT.

VII. Certain defects:

1. All claims should have included reference signs relating to the technical features referred to therein (Rule 6.2(b) PCT).

2. The cited documents D1 and D2 should have been not only acknowledged, but also briefly discussed in the opening part of the description (Rule 5.1(a)(ii) PCT), so as to put the invention into the proper perspective.

3. A revision of the application should have also been effected with an aim at correcting possible typing errors, such as the terms that appear to be missing in Claim 1 (e.g., "number" after IMSI on page 9, line 10) and Claim 8 (e.g., "station" after "mobile" on page 10, line 10).

VIII. Certain observations:

1. Similar to the case of Claim 1, the abbreviations employed in independent Claim 8 to refer to technical features of the claimed method, should have been accompanied by a full text definition, at least the first time one such feature is mentioned in the claim, without placing the abbreviation between parentheses (e.g. "Voice over Internet Protocol VoIP"; "General Packet Radio System GPRS"; "gateway GPRS serving node GGSN"; "International Mobile Subscriber Identity IMSI"; "Packet Data Protocol PDP"; etc.). This full text definitions are missing in independent Claim 8, and as a consequence, some of the features necessary to define the object for which protection is sought are left undefined (Article 6 PCT and PCT Guidelines III-4.1).

TELECOMMUNICATIONS SYSTEM

Background of the Invention

This invention relates to a telecommunication system and in particular it relates to UMTS (Universal Mobile Communications System).

Under UMTS proposals, a mobile station (MS) can be connected via radio interface both as an IP (Internet Protocol) terminal and as a traditional phone terminal. With an IP connection and the associated Quality of Service, QoS, mechanism, a terminal can make and receive a voice call via the packet-switch domain.

In order for an MS to receive a VoIP (Voice over Internet Protocol) call, it has to have an IP address assigned so that it can receive call setup messages and media streams over IP. However, under current UMTS specifications, a UMTS core network (CN) can initiate a PDP (Packet Data Protocol) context set up only for static IP addresses. This is because only the home gateway GPRS Support Node (GGSN) associated with the static IP address holds the IP to IMSI (International Mobile Subscriber Identity) address mapping required to contact the home location register (HLR), where GPRS denotes General Packet Radio System. When dynamic IP addressing is used and when an MS is not in an active PDP context, the network cannot initiate a PDP context set up and therefore the MS cannot receive calls.

Description of the Prior Art

Presently, there are two known solutions which enable a MS to receive VoIP (Voice over Internet Protocol) calls. These are 1) to use static IP address allocation or 2) to use dynamic IP address assignment but requiring an active PDP context to be always maintained.

These known solutions have several drawbacks. For the first solution of using static IP address allocation, an IP address is required for each mobile station regardless of its states. This is a waste of very limited IP address space. Also, for this solution, the assigned IP for a mobile station address reflects its association of its home network address space. According to the IP routing mechanism, the IP packets need to be routed via its home network regardless of its current location. This can result in significant effects on performance and service quality.

For the second known solution, an active PDP context needs to be maintained even when a mobile station is not in communication. This represents a waste of IP address space and other network resources such as the resource for PDP management.

The present invention arose in an attempt to provide an improved solution for a mobile station to receive the VOIP (Voice over Internet Protocol) calls.

Brief Summary of the Invention

According to the present invention, there is provided a telecommunication system including a mobile station, an MSISDN number associated with the station or its user, and means for the mobile station to receive Voice-Over Internet Protocol (VoIP) calls when it is roaming away from a home network, comprising: means for informing a local GGSN (gateway GPRS serving node) of the International Mobile subscriber Identity (IMSI) of the called mobile station, and means for enabling a local VoIP control server to map a called MSISDN number to the IMSI number.

A mapping table may be stored. Alternatively an enhanced terminal registration message may be provided so that, upon registration of a mobile station at a visiting

network, the mobile station informs the serving VOIP call control server of its IMSI number.

In a further aspect there is provided a method of enabling a mobile station of a telecommunications system to receive VoIP calls when roaming, comprising informing GGSN, of the roaming network, of the IMSI number of the mobile station, and enabling a VoIP control server to map the MSISDN number of the mobile to the IMSI number.

Brief Description of the Drawings

Embodiments of the invention will now be described, by way of example only, with reference to the accompanying drawings in which;

Figure 1 shows a UMTS mobile station connected via a radio interface to make and receive voice calls by either a circuit switch or packet-switch domain; and

Figure 2 shows a call setup procedure protocol to a roaming mobile station.

Detailed Description of Preferred Embodiments of the Invention

A UMTS mobile station (MS) can be connected via a radio interface both as an IP terminal and as a traditional mobile voice terminal. With an IP connection and the associated QoS (Quality of Service) mechanism, a terminal can make and receive a voice call via either the circuit-switch domain or the packet-switch domain. This is illustrated in Figure 1. A mobile station 1 is linked by a radio link to the UMTS Terrestrial Radio Access Network, UTRAN 2. A call may then be routed over a circuit-switch path, shown generally as 3, or a packet-switch path shown generally as 4. If the call is to be via the circuit-switch path, then it is passed through a switching circuit 5 which includes a

In order for a mobile station to receive a VOIP call, it has to have an IP address assigned so that it can receive call setup messages and media streams over IP.

According to a current UMTS specification, UMTS CN can initiate a PDP context setup only for static IP addresses. This is because only the GGSN associated with the static IP address holds the IP to IMSI address mapping required to contact the HLR. However, when dynamic IP addressing is used and when an MS is not in an active PDP context, the network cannot initiate PDP context setup and hence the MS cannot receive calls.

As described above, present methods of overcoming this problem are unsatisfactory.

The present invention is based on two assumptions. Firstly, the mobile user agrees to receive the VoIP calls when there is no PDP context yet established and secondly a mechanism must be provided in which, for any MS in its domain, the home gatekeeper is aware of the gatekeeper and its associated IP address that is currently serving the MS if it is roaming.

The present invention provides a solution to the problems of the prior art which supports dynamic IP address assignment and enables mobile terminated calls without pre-established PDP context. Essentially, the invention includes a mechanism for informing the serving GGSN of the IMSI number of the called MS, and a mechanism for the local (i. e. serving) gatekeeper (GK) to map the called MSISDN number to an IMSI number.

In order to achieve this in embodiments of the invention, an interface is required, between the serving GGSN and the serving gatekeeper (or other VoIP call control server) in order for the GGSN to receive a request from the gatekeeper to initiate a PDP context setup procedure using the IMSI number of the mobile station. In such a

request, the Quality of Service QoS requirement can be indicated for the PDP context. QoS parameters can be passed to the PDU notification message the GGSN sends to the serving GPRS support mode SGSN to get the mobile station to initiate a PDP context activation request. After PDP context is set up, the GGSN replies with the IP address of the mobile station. The entities which are involved, i.e. the GGSN and the gatekeeper or other entity, are within the same administrative domain (i.e. network). The association between the gatekeeper and the GGSN can be pre-configured.

In order to trigger a PDP context setup using the IMSI number, a mechanism is required for the local gatekeeper to map the MSISDN number to the IMSI number.

The IMSI number is a number which is associated with the mobile station (or more commonly with the subscriber identification module) SIM (card) which the user places within the mobile station, and which uniquely identifies that station or SIM. The number is generally not made public.

Two alternatives for triggering the PDP context set –up are proposed.

Firstly, the home gatekeeper of the called mobile station may be enhanced in order to map the mobile station's MSISDN number to its IMSI number. This mapping will be static and so the mapping table can be stored in a directory server for example and use an interface within the gatekeeper and the directory server to perform the mapping. Alternatively, an interface between the gatekeeper and the home location register (HLR) can be provided. In that case, the home gatekeeper then needs to pass the IMSI number of the called mobile station to the serving gatekeeper in the standard call setup message. For example, when so-called H323 messaging is used, the IMSI number is inserted as an alias address for the called party in a setup message. If SIP (Session Imitation Protocol) is used, then the IMSI number can be put as an alias in other messages. For H323

CLAIMS

1. A telecommunication system including a mobile station, an MSISDN number associated with the station or its user, and means for the mobile station to receive Voice-Over Internet Protocol (VoIP) calls when it is roaming away from a home network, comprising: means for informing a serving GGSN (gateway GPRS serving node) of the International Mobile subscriber Identity (IMSI) of the called mobile station, and means for enabling a VoIP call control server to map a called MSISDN number to the IMSI number.

2. A telecommunication system as claimed in Claim 1, including an interface between the serving GGSN and the serving VoIP call control server, enabling the GGSN to receive a request from the VoIP server to initiate PDP context set up procedures using the IMSI number of the mobile station.

3. A telecommunications system as claimed in Claim 2, wherein the Quality of Service Requirement (QoS) is indicated for the PDP context.

4. A telecommunications system as claimed in any preceding claim including a stored mapping table, mapping the MSISDN number of the mobile station to its IMSI number, the table being stored where it can be accessed by the home VoIP call control server, for passing to the serving VoIP call control server.

5. A telecommunications system as claimed in any of Claims 1 to 3 including means for providing an enhanced terminal registration message so that, upon registration, a mobile station informs the serving VoIP call control server of its IMSI number.

6. A telecommunication system as claimed in Claim 5, wherein the IMSI and MSISDN numbers are both put as aliases of the mobile station in call setup message(s) between home and serving VoIP call control server.

7. A telecommunication system as claimed in any preceding claim, wherein the VoIP call control server is a H323 gatekeeper or a SIP (Session Initiation Protocol) proxy/server.

8. A telecommunication system as claimed in any preceding claim which is a UMTS system.

9. A method of enabling a mobile station of a telecommunications system to receive VoIP calls when roaming, comprising informing a GGSN, of the roaming network, of the IMSI number of the mobile station, and enabling a VoIP control server to map the MSISDN number of the mobile to the IMSI number.

10. A method as claimed in Claim 10, including providing a stored mapping table, accessible by the home VoIP call control server, which maps the MSISDN number to its IMSI number.

11. A method as claimed in Claim 10, wherein the home VoIP call control server passes the IMSI number to the serving VoIP serving VoIP call control server.

12. A method as claimed in Claim 9, wherein when the mobile station registers with the roaming network, it informs the serving VoIP call control server with its IMSI number.

13. A method as claimed in Claim 10, wherein the IMSI number of the called party is passed from home VoIP call control server to serving VoIP call control server in the call setup message(s).

14. A method as claimed in any one of Claims 10 to 13, used in a UMTS system.

15. A Telecommunications system substantially as hereinbefore described with reference to, and as illustrated by, the accompanying drawings.

15. A method of enabling a mobile station of a telecommunications system to receive VoIP calls when roaming, substantially as hereinbefore described.

PATENT COOPERATION TREATY

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference	**FOR FURTHER ACTION** see Notification of Transmittal of International Search Report (Form PCT/ISA/220) as well as, where applicable, item 5 below.	
A.CASATI 2-3-		
International application No.	International filing date *(day/month/year)*	(Earliest) Priority Date *(day/month/year)*
PCT/GB 00/ 01481	18/04/2000	21/07/1999
Applicant		
LUCENT TECHNOLOGIES INC		

This International Search Report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This International Search Report consists of a total of 2 sheets.

[X] It is also accompanied by a copy of each prior art document cited in this report.

1. **Basis of the report**

   a. With regard to the **language,** the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

   [ ] the international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).

   b. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international search was carried out on the basis of the sequence listing :

   [ ] contained in the international application in written form.

   [ ] filed together with the international application in computer readable form.

   [ ] furnished subsequently to this Authority in written form.

   [ ] furnished subsequently to this Authority in computer readble form.

   [ ] the statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

   [ ] the statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished

2. [ ] **Certain claims were found unsearchable** (See Box I).

3. [ ] **Unity of invention is lacking** (see Box II).

4. With regard to the **title,**

   [X] the text is approved as submitted by the applicant.

   [ ] the text has been established by this Authority to read as follows:

5. With regard to the **abstract,**

   [X] the text is approved as submitted by the applicant.

   [ ] the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box III. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. The figure of the **drawings** to be published with the abstract is Figure No. 2

   [X] as suggested by the applicant.

   [ ] None of the figures.

   [ ] because the applicant failed to suggest a figure.

   [ ] because this figure better characterizes the invention.

INTERNATIONAL SEARCH REPORT

International Application No
PC[redacted] 00/01481

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 H04M7/00 H04Q7/22

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 H04M H04Q

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)
EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	WO 99 16266 A (ERICSSON TELEFON AB L M) 1 April 1999 (1999-04-01) page 4, line 25 -page 5, line 24	1,9
A	HAEMAELAEINEN J ET AL: "PROPOSED OPERATION OF GSM PACKET RADIO NETWORKS" IEEE INTERNATIONAL SYMPOSIUM ON PERSONAL, INDOOR AND MOBILE RADIO COMMUNICATIONS,XX,XX, vol. 1, page 372-377 XP002020137 page 373, right-hand column, line 16 - line 38 page 374, right-hand column, line 16 -page 375, left-hand column, line 29	1,9
A	WO 99 05830 A (ERICSSON TELEFON AB L M) 4 February 1999 (1999-02-04) page 3, line 30 -page 4, line 9	1,9

☐ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

° Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
22 June 2000	28/06/2000

Name and mailing address of the ISA	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL – 2280 HV Rijswijk Tel. (+31–70) 340–2040, Tx. 31 651 epo nl, Fax: (+31–70) 340–3016	Palencia Gutiérrez,C

Form PCT/ISA/210 (second sheet) (July 1992)

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No
PC[redacted] 00/01481

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 9916266 A	01-04-1999	AU 9287698 A	12-04-1999
		ZA 9808571 A	31-03-1999
WO 9905830 A	04-02-1999	AU 8363298 A	16-02-1999